NOVEMBER/DECEMBER 2024

23PEPH14B — CRYSTAL GROWTH AND THIN FILMS

Shanmuga Industries Arts & Science College T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define nucleation.
2. How solution growth technique help to grow the crystal?
3. Mention any four crystal systems.
4. Definition of super solubility.
5. Write the principle of vapour growth technique.
6. Give advantages of gel growth techniques.
7. What is pulsed LASER deposition?
8. Write application of thin film deposition.
9. What is the difference between capillarity model and atomistic model?
10. List some applications of thin films.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain the formation of critical nucleus.

Or

(b) Describe the types of nucleation.

12. (a) Discuss about solvent evaporation methods.

Or

(b) Sketch the solubility diagram and explain.

13. (a) Write a short notes on Czochralski growth.

Or

(b) Give account on Bridgeman method.

14. (a) What is thermal evaporation and its applications?

Or

(b) Explain the electron beam evaporation.

15. (a) What are the various stages in thin film formation?

Or

(b) Give a brief note on quartz crystal oscillator techniques.

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SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the classical theory of nucleation.

17. Differentiate low and high temperature solution growth with suitable theory.

18. Describe physical vapour deposition and its advantages.

19. Write short notes on :

(a) Pulsed LASER deposition

(b) Chemical bath deposition.

20. Briefly explain :

(a) Quartz crystal oscillator techniques

(b) Roll and measurement of film thickness.

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